REMARKS

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Claim Amendments

Claim 1 has been amended to include a proviso that neither a sulfurous acid nor sulfite is added to the solution. Support for this amendment is provided on page 3, lines 21-23 and page 4, lines 14-16 of the specification. As explained in the specification, one of the problems of the prior art is that a sulfurous acid compound (i.e., sulfurous acid or sulfite) is added for separating into 7S globulin and 11S globulin. The present invention has solved this problem. That is, the present invention provides a method of separating 7S globulin and 11 S globulin **without adding** a sulfurous acid compound.

Patentability Arguments

The patentability of the present invention over the disclosures of the references relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

Rejection Under 35 U.S.C. § 103(a)

Claims 1-4 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Saitoh et al. (U.S. 6,638,562) in view of Howard et al. (U.S. 4,368,151). This rejection is respectfully traversed.

The Position of the Examiner

The Examiner takes the position that claim 1 has been given its broadest and most reasonable interpretation, i.e., a process for producing soybean protein comprising heating a soybean protein solution under acidic conditions, and then fractionating it (ionic strength 0.02-0.2, pH 4.5-5.6) into a soluble fraction and an insoluble fraction. The Examiner asserts that Example 2 of Saitoh et al. discloses a process for producing soybean protein comprising heating a solution of defatted-soybean milk at pH 5.9 to 40°C (col. 9, lines 10-14),where phytase was

added to the soybean protein solution and fractionated to obtain an insoluble fraction and a soluble fraction (col. 9, lines 16-20). The Examiner contends that Saitoh et al. disclose a 7S and an 11S globulin protein with a phytic content of 0.05% weight of protein. The Examiner admits that Saitoh et al. do not teach "fractionation conditions" at an ionic strength of 0.02 and pH of 4.5-5.6.

The Examiner relies on Howard et al. as disclosing a method for fractionating 11S protein from 7S protein comprising a step of providing an ionic solution strength in the range from about 0.0005u to about 0.2u and at a pH range 5.3-6.3 (col. 11, lines 50-67).

The Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Saitoh et al. by using the fractionation conditions (ionic strength range 0.0005 to 0.2, pH 5.3) of Howard et al. during the fractionation process of Saitoh et al. in order to obtain a soluble fraction and an insoluble fraction.

Applicants' Arguments

Applicants respectfully disagree with the Examiner's position for the following reasons.

The presently claimed invention requires a method of separating 7S globulin and 11S globulin **without using a sulfurous acid compound**. The method comprises heating treatment under acidic conditions, adjusting an ionic strength to 0.02 or more and adjusting pH of the solution to 4.5 to <5.6.

Saitoh et al. disclose a method of separating 7S globulin and 11S globulin without using a sulfurous acid compound. The method comprises heating treatment under acidic condition, and phytase treatment, and then, separating at pH 5.6-6.6. However, adjustment of an ionic strength, as required by Applicants' claims, is not carried out in Saitoh et al. This deficiency is acknowledged by the Examiner.

Howard et al. disclose a method of separating 7S globulin and 11S globulin in the presence of sulfite ion. The method comprises: (A) providing to a solution a sufficient amount of: (i) **from about 0.05 mM to about 5.0 mM sulfite ion**; and (ii) water-soluble salt to provide an ionic solution strength ranging from about 0.0005u to about 0.2u; (B) precipitating at least a

major weight of said 11S protein from said solution within the pH 5.3-6.3 range; and (C) recovering the precipitated 11S protein from said solution. (Please see claim 1 of Howard et al.)

The presence of sulfite ion is **essential** for Howard et al. Therefore, one of ordinary skill in the art would not combine the teachings of Saitoh et al. and Howard et al., and arrive at Applicants' claimed invention, particularly since the Howard et al. method employs a process which is specifically excluded by Applicants' claims. Thus, Howard et al. fail to remedy the deficiencies of Saitoh et al.

Even if the teachings of Saitoh et al. and Howard et al. are combined, a skilled person in the art would not arrive at Applicants' presently claimed method of separating 7S globulin and 11S globulin **without using a sulfurous acid compound**.

	Presently Claimed Invention	Saitoh et al.	Howard et al.
A. Sulfurous acid compound			○
B. Heating under acidic condition	○	○	
C. Adjustment of an ionic strength	○		○
D. Phytase treatment		○	
E. Separating under acidic condition	○	○	○
Effect	Separating 7S/11S, Improving separation-precipitation rate of 11S	Separating 7S/11S	Separating 7S/11S

In addition, the presently claimed invention has the excellent and unexpected effect of improving not only the separation ratio between 7S and 11S, but also the "separation precipitation rate" of 11S.

For example, the separation precipitation rate of 11S is compared under various conditions, such as presence or absence of heating treatment (Table 1 of Applicants' specification), and difference of ionic strength (Table 4 of Applicants' specification). The separation precipitation rate of insoluble fraction (i.e., 11S) is remarkably improved by heat treatment and appropriate ionic strength, although the separation ratio between 7S and 11S is

unchanged. The method of the presently claimed invention remarkably improves the separation precipitation rate of the insoluble fraction (11S), in order to separate 7S globulin and 11S globulin conveniently in an industrial scale.

Both Saitoh et al. and Howard et al. disclose a separation of 7S globulin and 11S globulin. However, neither of these references, taken alone or in combination, teach or suggest a separation precipitation rate of insoluble fraction (11S).

The method of Applicants' claims, comprising heating treatment under acidic conditions, adjusting an ionic strength to 0.02 or more and adjusting pH of the solution to 4.5 to < 5.6, remarkably improves separation-precipitation rate of 11S. This effect is excellent and unexpected.

For these reasons, the invention of Applicants' claims 1-4 is clearly patentable over Saitoh et al. in view of Howard et al. It is respectfully requested that the rejection be withdrawn.

Conclusion

Therefore, in view of the foregoing amendments and remarks, it is submitted that ground of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

Masahiro ISHIKAWA et al.

/Amy E. Schmid/
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By _____
Amy E. Schmid
Registration No. 55,965
Attorney for Applicants

AES/cbc
Washington, D.C. 20005-1503
Telephone (202) 721-8200
Facsimile (202) 721-8250
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